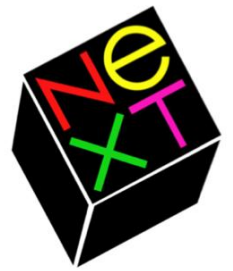# What's NeXT?
Software, Psychedelics and the Origins of OS X & iOS
– Andrew C. Stone, @twittelator

This talk was first delivered at CocoaConf's Yosemite gathering 4/21/15

Due to the emergent nature of this gathering, I hope we can have a continuing emergent discussion of how Steve Jobs and the people who were literally "called" to help him manifest some very deeply philosophical and spiritual ideas and bring them to the physicality of the pads, pods, and phones of the current NOW.
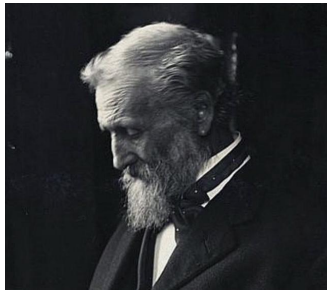
John Muir, a man we are forever grateful for his efforts to preserve Yosemite National Park said:

When we try to pick out anything by itself, we find it hitched to everything else in the Universe.
        - *My First Summer in the Sierra* , 1911, page 110.

 But don't worry about a polyanna unicorn-laced screed, I'll get to the Dark Side eventually...

Today I'm going to share with you stories of the people and events that helped create the World of Today and talk freely about the influences and the coming of age stories affecting the kids born in the mid-1950's (Like Steve, Bill Gates, me & probably many of you)

- those of us wide-eyed from growing up listening to the Beatles, the Grateful Dead and Pink Floyd - too young to enjoy the fruits of Free Love, but old enough to know we wanted it!'

The grand narrative was alive and well in '68 - we had a MOON to reach! We had Russian Soviets to proove ourselves superior to. We were in year 2 of Star Trek and the future was very bright.

Stories - that's what we are made of! And civilization provides us with the stories that guide our internal sense of who we are and what our mission in life is - however civilization itself is an emergent phenomena - and so the

mission evolves.

We saw communicators in Star Trek and then, we got the Motorola flip phone that mimicked it perfectly.

The tablets are all over the Enterprise, Replicators - ie 3D printers are repairing body parts. We dreamed it - we built it. Stories - that's what we're made of!

Our particular story begins in a modest Sunnyvale California neighborhood with a now fellow Albuquerquean and Apple Computer Employee #4, Bill Fernandez. He's 13, it's 1968, and he invites a scrawny and scraggly haired classmate over one day. The boy is transfixed in front of a Japanese landscape print that Bill's mom, Bambi, had brought from Ha'waii. He's taken by the sheer force of design and simplicity of just a few strokes. The boy is, of course, Steve Jobs. It's outside Bambi's house where Bill introduces SJ to Woz. And both Bill &
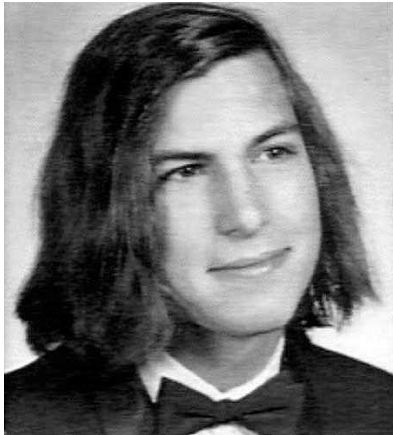
Bambi go on to play important roles in how you have a unix box in your hand today.

So coming of age to a very psychedelic bay area that was trying to find the next big thing in consciousness, which was being able to reach the ecstatic heights of a fully functioning brain on LSD simply by learning to do ancient mystical-state-inducing practices like yoga, chanting, sacred dance and meditation.


And, in the fashion of learning how to "go back to the land" with a manual, namely, "The
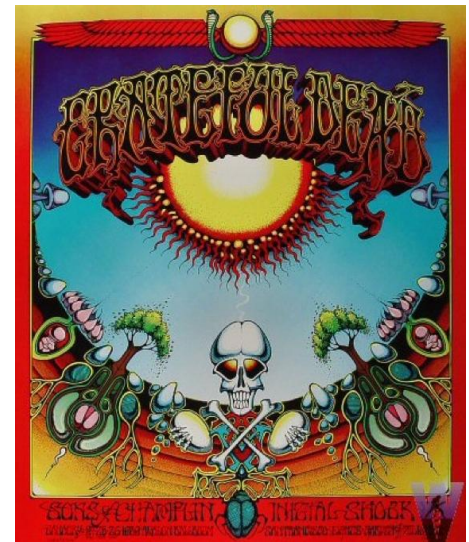

Whole Earth Catalog"; there was a manual to learn the gnostic arts - to reach ecstasy through expanded consciousness "Be Here Now" , written by Tim Leary's Harvard co-conspirator Ram Dass, né Richard

Alpert, and released in October 1971.

For young seekers, this book was - and still is - a breakthrough happening. People were Om'ing, doing pranayama, fasting, dancing and practicing tantra in order to get connected on High on a more enduring basis than that afforded by psychedelics.
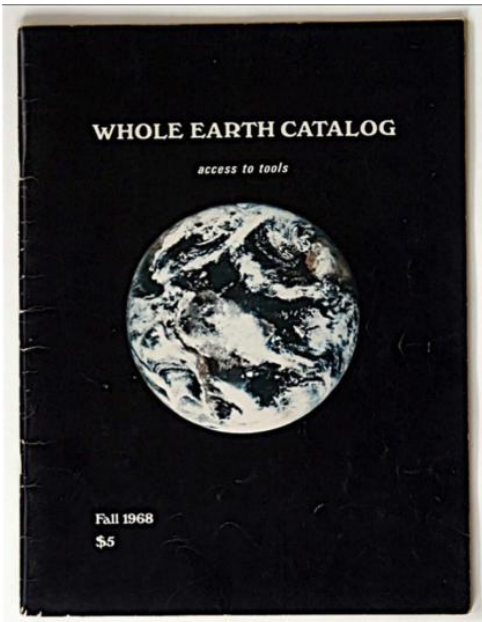
I began doing yoga in 1970 and it's helped me write code and survive sitting all these years - and BE HERE NOW obviously had a huge impact on Steve because when he and Daniel Kottke went to India, they sought out and met with Ram Dass's guru, Neem Karoli Baba.
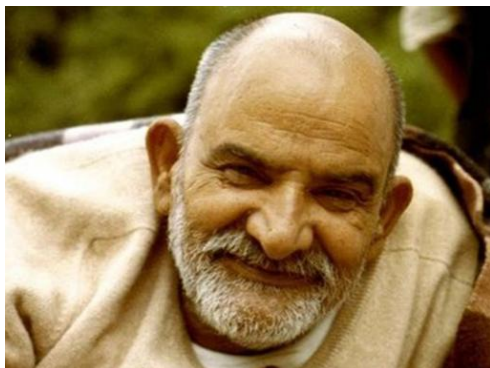
From the DailyMail June 2012:

It wasn't a secret that Steve Jobs dabbled in recreational drugs, but new Pentagon files reveal just how much he valued the mind-altering substances, crediting his LSD use with having a 'life-changing' effect on him.

In a government security clearance questionnaire, filled out in 1988 and released June 2012, the late Apple founder divulged he took LSD up to 15 times between 1972 and 1976.

While he said he had 'no words' to explain how he reacted to the hallucinogenic drug, he told Department of Defense officials: 'It was a positive life changing experience for me and I am glad I went through that experience'.

The next decade Apple is just taking off, and the legend goes that Steve even encouraged his engineers to try LSD.

Some of the great Macintosh software titles were envisioned while high on acid, but that was to be expected by this time because it had been almost a decade since Francis Crick made breakthroughs into the helical nature of DNA on LSD trips in 1967.

Meanwhile, I'm spending a decade with the counterculture in New Mexico inventing an alternative green future - and remember this before using the word "dirty" to describe a "hippie" - solar energy, green building, psychedelics and cannabis for well-being, organic gardening and urban homesteading - all highly desirable top-shelf commodities today. But after awhile, all of this became boring.

However, the Mac+ I was using to design buildings was not boring whatsoever.

It was magical and seductive and it connected me to the world of Bulletin Board Services and a 300 baud connection to another computer that you had to wait in line to connect with! The proto-Internet.

I went to my first MacWorld in San Francisco, January 1987. They offered classes and someone tipped me off to this guy Bill Atkinson who was introducing a new Apple application HyperCard.

It was a pre-ship demo, but Bill was charged and showing how anyone could program a Mac with simple English commands but more importantly, a visual interface creator. Bill made it seem like anyone could program with HyperCard, and he wowed the audience.
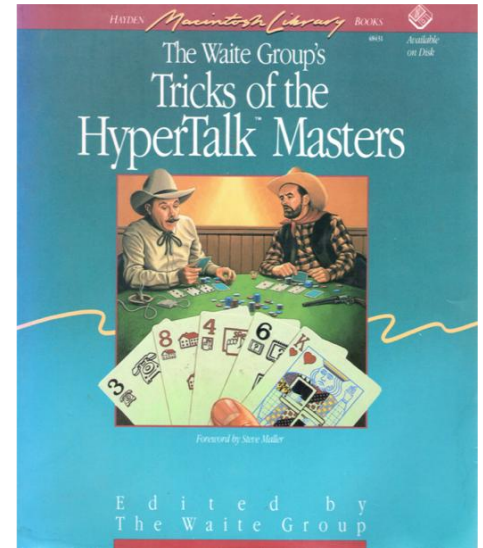
I mention this, because I totally believed him, in fact, I wanted to write cool programs so I could one day get up and share my excitement like Bill. His demo inspired me to become a programmer on the spot.

In July '87 when HyperCard shipped, I ran out and bought the first copy that hit Albuquerque that summer and had a blast making the Mayan Icons and the Math Quiz stacks and even a Calculus III cheat sheet.

I got good enough to write a few chapters of *The Tricks of the HyperTalk Masters* and build a user-interface testing harness for Sandia National Labs. I ran the HyperCard Special Interest group for AppleQuerque - our Mac Users Group in Albuquerque.

In March 1989, two young men in black suits and narrow black ties - almost Mormonesque in their mission - brought the first prototype of Steve Job's NeXT Computer, the Cube, to demo to students and faculty at the University of New Mexico. I asked if they would come demo that night at AppleQuerque - and they invited me and the president, Kris Jensen, out for dinner. We took them to the most expensive restaurant in Albuquerque. By dessert they are busy recruiting Kris and me to become NeXT developers.

That was a critical juncture in my life's story - because we knew it wouldn't be successful if people like us didn't take up the challenge - but it was $10K! And $2K for the printer, and $2K more for the mandatory developer camp. $14K in '89 = $28K today - so this was a major career investment.

One of Ram Dass's favorite mystics, George Gurdjieff, was fond of saying that you must charge people for spiritual lessons, because only then will they value the lesson - they have invested so much already, they will stay and learn to get their money's worth!
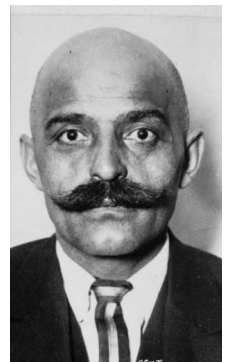
Off to NeXT Camp in May for 4 days of non-stop coding lessons by Bruce Blumberg and Randy Nelson of the Flying Brothers Karamatzov fame - a chainsaw juggling team from Santa Cruz, and my classmates included future Apple VP of Graphics Peter Graffignino. Of course, I studied all the docs beforehand because I imagined my California counterparts would be so much smarter than me that I'd need a head start. Turns out, intelligence is not geographic!

I started coding on TextArt - a type manipulation program that lets you do fun things with text, for the first time in real time on a consumer computer using DisplayPostscript®, Adobe's proprietary "real time laser printer rastering engine". In fact, it was this proprietary nature that was no end of frustration for Steve and the NeXT Engineers like Leo Horvitz because an Adobe engineer had to be present onsite in a locked room for code inspection.

Memory bugs weren't addressed and that meant unhappy customers, and the bad blood that ensued could be yet another reason you can't see Adobe Flash content on your iOS devices today, and definitely the reason Apple developed their own pro line of applications.

OK, perhaps an overstatement, but Steve vowed never to let a third party stand in his way again - thus Aqua, the display engine for Mac OS X, was home-rolled by Ralph Brunner and team.

Ralph and Stan Jirman - author of Aperture - had a NeXT software company, CaffeineSoft which made TIFFany, and like many independent NeXT developers, was folded into the mothership when Apple needed ObjectiveC talent after the reverse takeover by NeXT on December 20, 1996 - but all of that is yet to come, first we wander into the wilderness.

4 months later in September 1989, we have TextArt version 1.0 ready to ship for NeXTStep 0.9 - it's the first independently produced third party application for the NeXT, so we fly out to San Francisco to demo to Steve.
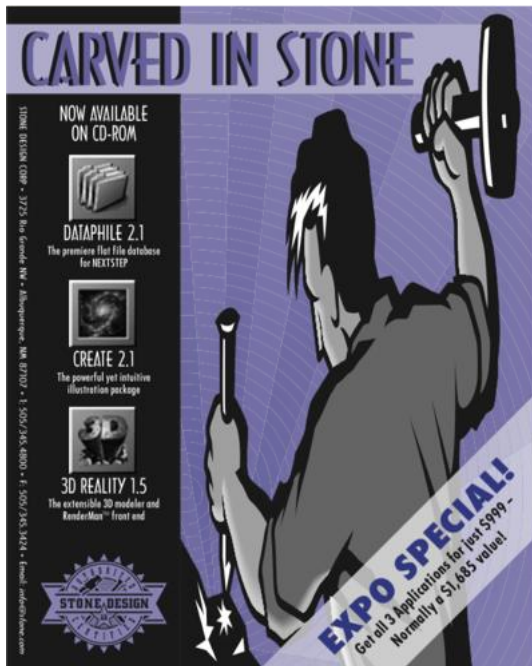
I'd gotten the vibe from NeXT Camp that these guys were pretty into the corporate look (which initially was a real shock to me since I had heard the 70's Steve stories) so I arrived in a dark blue suit wearing an Hermes tie in a Windsor knot, just in case.

I was nervous, and I remember how he stormed into the room, so I knew it was no time for pleasantries, just business.

I quickly demoed the software to Steve and he didn't diss it. He says, "This is great! You should sell this for $49". I replied, "The Optical Media it comes on costs us $49, how can we?".

"How would you like to build a flatfile database for the NeXT, akin to Filemaker?" What? How had it come to be that Steve Jobs was asking a New Mexican cyberpunk hippie to build something that important for the platform? Basically, almost none of the successful Macintosh software houses had gotten excited about the NeXT, so Steve had to recruit all new players.

And thus began a great software challenge. Being object-oriented, we based both Create (TextArt's successor) and the database maker DataPhile on one set of objects so all the drawing functions would be available to DataPhile.

These were some of the first power apps for the NeXT and they sold very well. Create is in version 14.4 and I'm still using it on Mac OS X today.

DataPhile made us, as Steve had promised, a lot of money

This page created by *TextArt* from Stone Design

But it was the friends we made, and the community we helped build that made the NeXT what it was - a dark box to keep the bright light of Steve's original inspirations glowing like embers until the time was right.

And Bambi was a big part of that community. She served in Developer Relations (and later as Avi Tevanian's assistant at Apple), but she acted as a special liason with the third party developers. She was basically the Den Mother of us NeXT developers, reaching out to take care of us when the boat started rocking. The Sunnyvale lady whose huge role in Steve's story is not documented in any book or movie (yet).

You see, this is the forgotten decade for several reasons. It was literally a dark time. Steve first tried to sell Academia on the cube - why it was perfect with the compleat works of Shakespeare
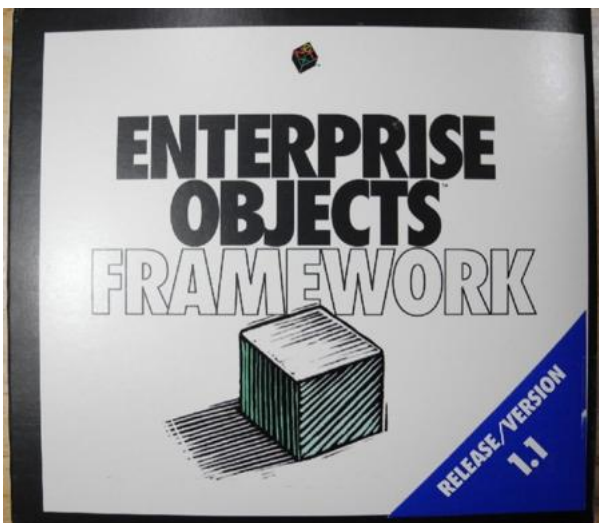
and the first online Webster's Dictionary. Most importantly, InterfaceBuilder allowed non-programmers to make applications. But at $12,000 for a cube and mandatory printer, these were just too expensive. A few prestigious schools bought some - and bought our software - but the cube didn't take off.

Then, NeXT went after the burgeoning publishing market with a cheaper machine and, late to the game, 32 bit color. Japan, Germany and France admired the technology, and bought a little. Alas, publishing also turned out to be a marketing failure.

Who's left? Fortune 500 and the Military/Industrial complex. On to Wallstreet and the National Security Agency. Well, these clients certainly had the cash missing in other markets, but geez, this is feeling desperate, especially for someone familiar with the Buddhist precept of Right Livelihood. Steve had gone to India to seek enlightenment only to sell his soul to Babylon? Geeesh.

There were incredible software successes with the Appkit, the DatabaseKit, Enterprise Object Framework, and WebObjects - the core technologies behind iTunes and App Stores today. But despite
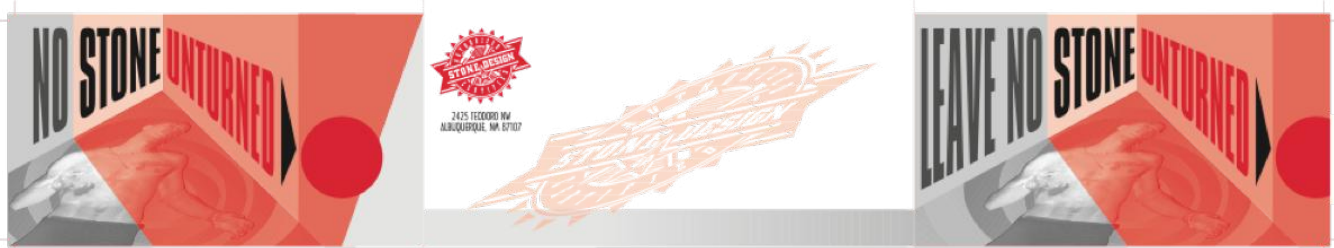
these advances, people were not buying the machines.

That did not damper the true believers spirits though, and in karmic retribution for taking NSA money (albeit through an anonymous sounding outfit in some podunk place in Texas), in October 1992 we decided to throw a big psychedelic bash to launch 3D Reality and bring the community together at the Palace of Fine Arts for an evening of ambience and ambient sounds, what became known as the First of the Stone Raves.

In 1990, I had met John Perry Barlow when he interviewed me for NeXTWorld Magazine - and being deadheads running cubes, we became fast friends.

The early '90's witnessed another psychedelic renaissance in San Francisco, and the deadheads for whom LSD had never fallen from grace, were happy to introduce a whole other segment of society to psychedelics.

Burning Man is in its tribal infancy, "Raves" are just becoming a thing, Sasha Shulgin has begun synthesizing interesting new compounds like 2CB, and Terrence McKenna is becoming a household name.

There is renewed interest in a most unusual substance - unusual because it's also produced naturally within us - DiMethylTriptamine - DMT.

So inviting Barlow's bay area pals like Grateful Dead guitarist Bobby Weir and musician Todd Ruddgren and cypherpunk pal John Gilmore and their friends was a lovely complement to the NeXT engineers, NeXT third party developers and our pals from the NSA.


But much wetware was patched that night and I believe some new circuitry created. Barlow & I were doing our job to keep the Mysticism alive and well.

We threw two more raves - these corresponded with NeXTWorld conventions in 1993 and 1994 - so they got even bigger and crazier as we invited our San Francisco freaky friends to provide circus entertainment.

But it was the second rave in 1993 which was immortalized in Ira Glass's This American Life, #74 "Conventions" where Barlow describes the day when he and Dr. Cynthia Horner fell in love at first sight.

And people who were destined to be together met that night.
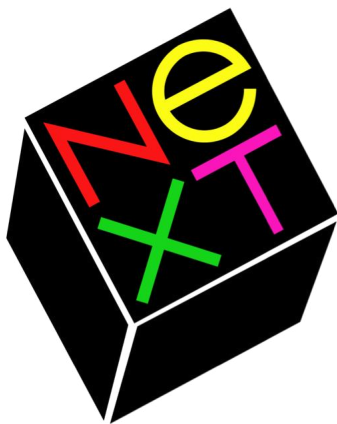
The community that was self-identifying as NeXT had a place to come together and, well, in the style of the Grateful Dead, take sacrement and create Magick together. From a guerrilla marketing standpoint, the raves were solid gold - still reverberating through the years, with couples who fell in love and are still together today, the business relationships built from that very deep place of nowhere and nowhen. "The NeXT Community"

By 1994, the NeXT hardware is end of lifed. The reality is simply that a small company cannot lead the R&D effort needed to always have the best, latest, greatest. The dream of NeXT Computer, Inc. being a Hardware Company was over. Drop the Computer. Run with the awesome software!

The NeXTStep software is ported to run on Hewlett Packards, Intel and SUN SPARC chipsets as OpenStep. A small outfit can never out R&D the big boys in hardware, so why not concentrate on the software stack? For us developers, it could mean more sales if they can swing seats. Remember, software was expensive - DataPhile was $695 per seat, so each sale counted (not like today's Apps where it takes a thousand $1 app sales to net $700).

Developers and startups were fleeing, moral was low. In 1995, a new last ditch effort to port OpenStep to Sun Microsystem's SOLARIS is begun, and we're among a very small group of remaining developers, and we port Create to SOLARIS. We sold 5 copies before it was silently yanked from the market.

I didn't give up for a few reasons - firstly, we'd done very well in the early years, so my belief had backing in previous success. Plus, the slowdown meant I could attend to other interests, such as
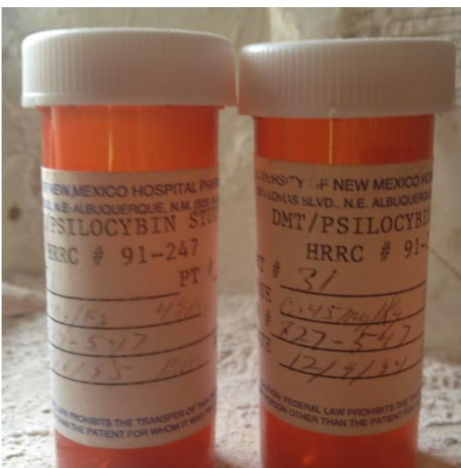
participating in the first government-sanctioned human psychedelic trials in over 20 years with Dr. Rick Strassman. He was investigating the effects of DMT in a scientifically rigorous way.

Regarding the experiments, that's a very long conversation we'll have to have later!
I concluded that DMT was critical to understanding and healing our relationship with the natural world, to understanding the paradox of being separate and joined, and that this research must not simply end up behind a paywall in a journal but needed to reach a wider audience.
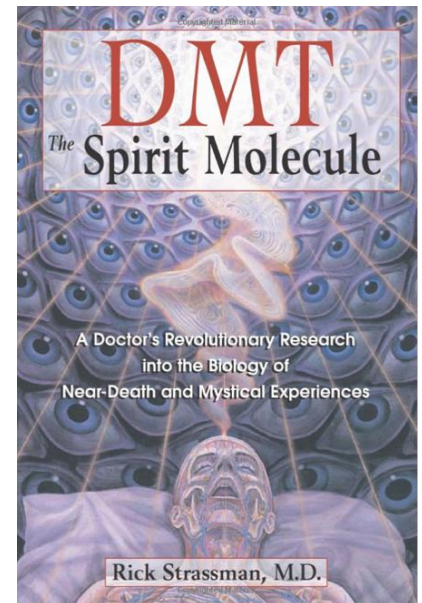
Because of my friendship with John Barlow, we asked the Grateful Dead's Rex Foundation to donate $10,000 to Rick so he could take the time to write the results of the volunteers' experiences into layperson accessible book, "DMT: The Spirit Molecule" A Doctor's Revolutionary Research Into the Biology of Near-Death and Mystical Experiences.

Needless to say, in the Psychedelic community, this book was a runaway hit because there was very little information concerning this endogenous - that is, produced naturally in our own bodies- chemical.

Historically, the West's embracement of materialism has limited research of consciousness - even questioning its existence. Materialism holds that the body is a machine, the mind is a phenomen of the physical brain, matter is inanimate, etc. And so the West was the last to the DMT table, where scores of South American tribes have discovered different herbal formulas to allow DMT to enter the brain before being metabolized, allowing the experient to watch the core manifestation of Existence and perceive that you are part of it, and You are All of it in some paradoxical manner.

Luckily, the experience is 100% scientifically replicable and it affects people at a very intense level that has nothing to do with the beliefs of the individual.

I believe that our circuitry has this avatar-state capability, and techniques like yoga, meditation, fasting, dance, drumming, chanting, psychedelics engage it.

Computers and information are like a pale shadow against the backdrop of a fully operational brain. The Cosmic web is our true home, and it is everywhere and nowhere simultaneously, nonow and everwhen. I look forward to the day when the meta mind evolves as
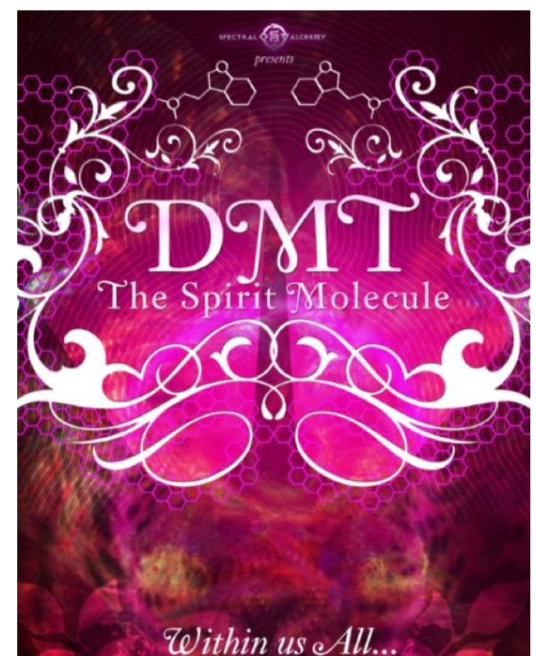
we plug our individual consciousnesses into the awareness of the animate universe.

In 2007, The Spirit Molecule's success led Austin filmmaker Mitch Schultz to make an indy movie base on the book - interviewing Dr. Strassman, some of the volunteers, and notables from the greater psychedelic community. An interesting format and it became a top documentary download in 2010 when it finally got distribution.

And, as all seems to be doom and gloom in the NeXT World, a miracle happens - Dec 20th 1996, Apple buys Next for 428 Million dollars and 1.5 million shares of Apple stock.

Someone asks me, what does this mean? My instant response "I think I just got a raise". Now my software could be used by millions of users! Little did I know then that it would it be five years before Mac OS X 1.0 shipped, and 10 years before it was completely accepted by old Mac users.

Apple calls me, sends me to Redwood City NeXT HQ, gives me a cubicle for 24 hours and access to Jean-Marie Hullot's special espresso machine and a PPC running OpenStep. The port is done by dawn, and then I got to demo Create running on PPC at 1997 MacWorld Boston at the keynote given by Guy Kawasaki - Gil Amelio is still the CEO - Steve has not yet transitioned back to CEO, but a decade later, once again I'm a Mac developer and leading the charge of object-oriented programming.

NeXTStep had become OpenStep, then Mac OS X and now iOS - something almost unheard of in software engineering, something magical - a technology not only survives 25 years but thrives and evolves and the NeXT community gets to use it's sharply honed ObjectiveC and XCode skills
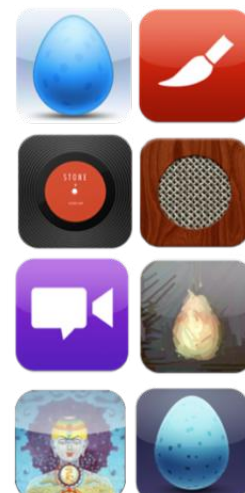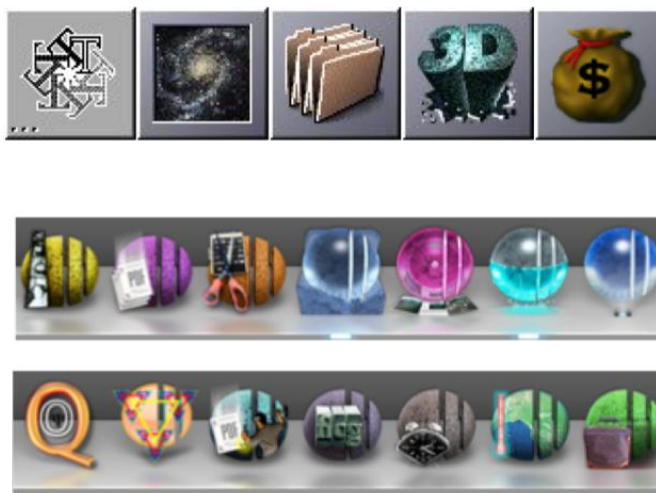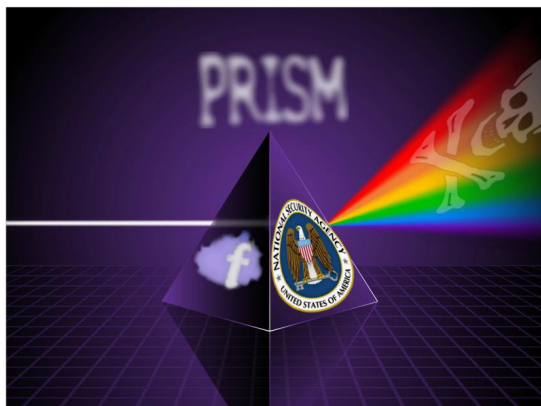
There was a grand feeling of having chosen the underdog's underdog and being part of a small group of people that led the stray puppy home, and then being part of the next 18 years when this underdog becomes the world's most profitable corporation and replaced the mighty Ma Bell AT&T on the Dow Jones Industrial Average. Being an underdog sort of person, I can see after almost 30 years, 30 applications and apps, my job is done here.

And what a long strange trip it's been. On final reflection, it was to Steve I had my loyalty, and it's thanks to Edward Snowden for that awakening.

What started out as us believing we were working on the tools that would liberate humanity with knowledge and understanding has morphed into a frightful police state where every message and word is watched and recorded
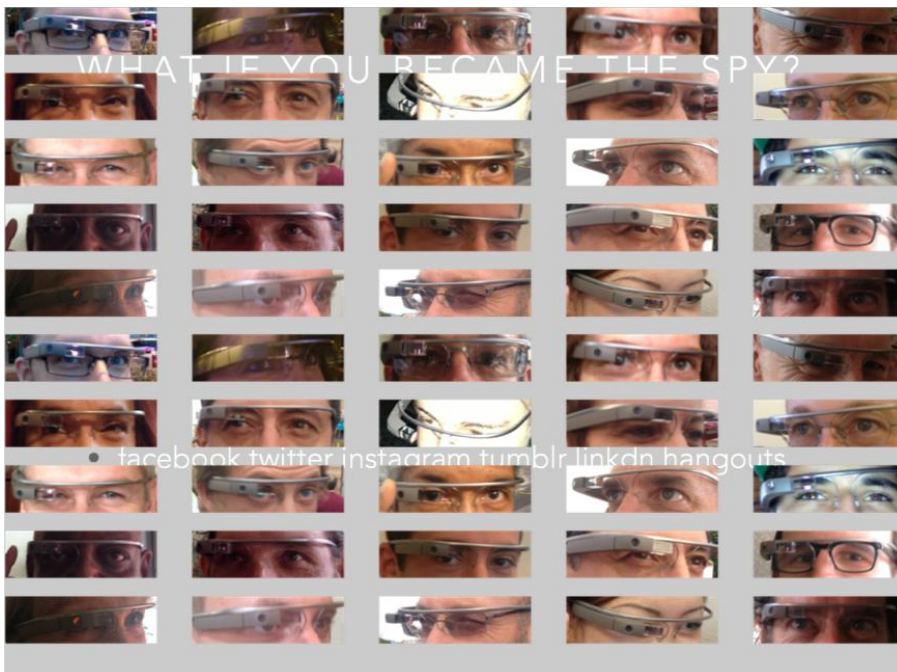
THE // INTERCEPT   FEATURES   GREENWALD   FROOMKIN   DOCUMENTS   STAFF   CONTACT   //

STRAWHORSE: ATTACKING THE MACOS AND IOS SOFTWARE DEVELOPMENT KIT

TUESDAY AT 1:51 AM

DOCUMENT   TEXT   Zoom   Q Search

[edit] (S//NF) Strawhorse: Attacking the MacOS and iOS Software Development Kit

(S) Presenter: ██████████, Sandia National Laboratories

(S//NF) Ken Thompson's gcc attack (described in his 1984 Turing award acceptance speech) motivates the StrawMan work: what can be done of benefit to the US Intelligence Community (IC) if one can make an arbitrary modification to a system compiler or Software Development Kit (SDK)? A (whacked) SDK can provide a subtle injection vector onto standalone developer networks, or it can modify any binary compiled by that SDK. In the past, we have watermarked binaries for attribution, used binaries as an exfiltration mechanism, and inserted Trojans into compiled binaries.
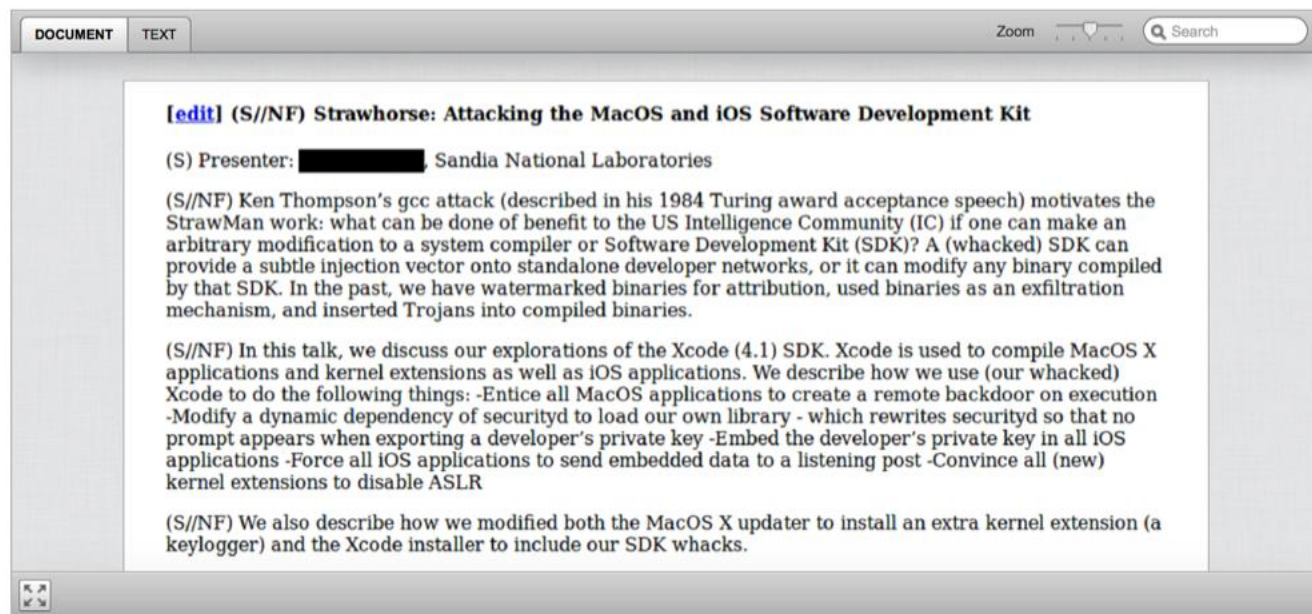
(S//NF) In this talk, we discuss our explorations of the Xcode (4.1) SDK. Xcode is used to compile MacOS X applications and kernel extensions as well as iOS applications. We describe how we use (our whacked) Xcode to do the following things: -Entice all MacOS applications to create a remote backdoor on execution -Modify a dynamic dependency of securityd to load our own library - which rewrites securityd so that no prompt appears when exporting a developer's private key -Embed the developer's private key in all iOS applications -Force all iOS applications to send embedded data to a listening post -Convince all (new) kernel extensions to disable ASLR

(S//NF) We also describe how we modified both the MacOS X updater to install an extra kernel extension (a keylogger) and the Xcode installer to include our SDK whacks.

And what's so ironic is that it's the citizens who are streaming the live data of their own lives openly and notoriously through facebook and twitter.

But now we are confronted with a true test of our morality and faith - On March 10 2015, Jeremy Scahill of the Intercept, published some Snowden documents that show the CIA and Sandia National Labs - alas, from my home town of Albuquerque - have hacked the iPhone and iPad.

But what is so egregious, so immoral, so unethical that it staggers the imagination, our Federal Government was invading iOS Developer's machines, inserting key loggers and Whacking XCODE to insert malware and spyware onto any iPhone which has installed the Developer's apps.

What this means is that the US GOV has risked the credibility of all iOS developers and Apple - TRUST is something that is so valuable, that once it is lost - it is almost impossible to regain.

Where is the media to cover this? Shall we pretend that none of this is happening, that there is not Homeland Security everywhere there are philosophers and people of conscience - including here?
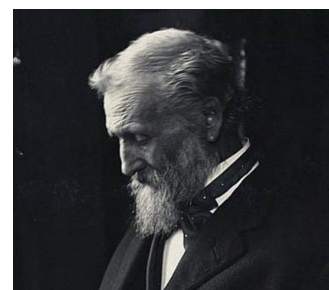
Luckily, I know every spook has a soul, every participant in the Police State can awaken, can repudiate a surveilled world.

So, here we are at the balance point between alternate futures - one driven by fear, power and corruption, and one driven by love, consciousness and awakening.

As we relegate more and more tasks to computers and robots, what is it exactly are we trying to achieve, a total disentanglement from physical life? Or time to ponder the big questions? Stories, that's what we're made of - what's your story going to be?

Luckily, we have more good advice from John Muir:

Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves.

-- Our National Parks , 1901, page 56.